WHAT IS CLAIMED IS:

1. A semiconductor device including a MOS transistor having:

a semiconductor substrate;

an oxide film disposed on said semiconductor substrate; and

a gate electrode selectively disposed on said oxide film,

said oxide film being disposed on an underside and a side surface of said gate electrode, and being disposed on said semiconductor substrate in an out-of-gate-electrode region corresponding to a region other than the underside and the side surface of said gate electrode,

said oxide film underling said gate electrode being made thicker in thickness under the edge proximity than under the central portion of said gate electrode, and

said oxide film to be disposed on said out-of-gate-electrode region being made thinner in thickness than said oxide film to be disposed on the side surface of said gate electrode.

2. The semiconductor device according to claim 1, wherein

said oxide film to be disposed on said out-of-gate-electrode region is made thinner in thickness than said oxide film under the central portion of said gate electrode.

3. The semiconductor device according to claim 1, further comprising:

an oxidation inhibiting layer composed of an antioxidant disposed between said semiconductor substrate and said oxide film in said out-of-gate-electrode region.

4. A semiconductor device including a MOS transistor having:

a semiconductor substrate;

an oxide film disposed on said semiconductor substrate; and

a gate electrode selectively disposed on said oxide film,

said oxide film being disposed on an underside and a side surface of said gate electrode,

said oxide film underling said gate electrode being made thicker in thickness under the edge proximity than under the central portion of said gate electrode, and

said oxide film to be disposed on the side surface of said gate electrode being made thinner than said oxide film to be disposed under the central portion of said gate electrode.

5. The semiconductor device according to claim 4 further comprising:

an oxidation inhibiting layer composed of an antioxidant disposed between the side surface of said gate electrode and said oxide film.

6. The semiconductor device according to claim 4, wherein

said oxide film is also disposed on said semiconductor substrate in an out-of-gate-electrode region corresponding to a region other than the underside and side surface of said gate electrode, and

said oxide film in said out-of-gate-electrode region is made thinner in thickness than said oxide film to be disposed under the central portion of said gate electrode.

7. The semiconductor device according to claim 6 further comprising:

a first oxidation inhibiting layer composed of an antioxidant disposed between the side surface of said gate electrode and said oxide film; and

a second oxidation inhibiting layer composed of an antioxidant disposed between said semiconductor substrate and said oxide film in said out-of-gate-electrode region.

8. A method of manufacturing a semiconductor device comprising the steps of:

(a) successively depositing an oxide film and a conductive layer on a semiconductor substrate;

(b) patterning said conductive layer to form a gate electrode, by performing the step (b), said oxide film being made thinner in thickness in an out-of-gate electrode region where said gate electrode is not formed;

(c) forming an oxidation inhibiting layer composed of an antioxidant between said oxide film and said semiconductor substrate in said out-of-gate-electrode region;

(d) performing an oxidation processing over the entire surface of said semiconductor substrate after the step (c) ; and

(e) introducing impurity of a predetermined conductivity by using said gate electrode as a mask, to form a source/drain region in the surface of said semiconductor substrate, wherein

a MOS transistor is made up of said gate electrode, said oxide film underlying said gate electrode and said source/drain region,

by performing the step (d), said oxide film underlying said gate electrode is formed on the side surface of said gate electrode and is made thicker in thickness under the edge proximity than the under the central portion of said gate electrode, and

said oxide film in said out-of-gate-electrode region is made thinner in thickness than said oxide film to be formed on the side surface of said gate electrode.

9. The method according to claim 8, wherein

by performing the step (d), said oxide film in said out-of-gate-electrode region is made thinner in thickness than said oxide film underlying the central portion of said gate electrode.

10. The method according to claim 8, wherein

the step (c) includes the step of implanting from above gas having an oxidation inhibiting function and having higher reactivity with said semiconductor substrate than said oxide film by using said gate electrode as a mask, to form said oxidation inhibiting layer.

11. A method of manufacturing a semiconductor device comprising the steps of:

(a) successively depositing an oxide film and a conductive layer on a semiconductor substrate;

(b) patterning said conductive layer to form a gate electrode;

(c) forming a first oxidation inhibiting layer composed of an antioxidant on the side surface of said gate electrode;

(d) performing an oxidation processing over the entire surface of said semiconductor substrate after step (c) ; and

(e) introducing impurity of a predetermined conductivity by using said gate electrode as a mask, to form a source/drain region in the surface of said semiconductor substrate, wherein

a MOS transistor is made up of said gate electrode, said oxide film underlying

said gate electrode and said source/drain region,

by performing the step (d), said oxide film underlying said gate electrode is formed on the side surface of said gate electrode and is made thicker in thickness under the edge proximity than under the central portion of said gate electrode, and

said oxide film to be formed on the side surface of said gate electrode is made thinner in thickness than said oxide film underlying the central portion of said gate electrode.

12. The method according to claim 11 wherein

the step (b) includes the step of allowing part of said conductive layer to remain in an out-of-gate-electrode region corresponding to the area except for the region for forming said gate electrode, and

the step (c) further includes the step of removing said conductive layer and said first oxidation inhibiting layer in said out-of-gate-electrode region after forming said first oxidation inhibiting layer.

13. The method according to claim 12, wherein

the step (c) includes a thermal treatment, and

the step (e) includes the steps of:

(e-1) introducing impurity of said predetermined conductivity at a first impurity concentration; and

(e-2) introducing impurity of said predetermined conductivity at a second impurity concentration higher than said first impurity concentration, and

the step (e-1) is performed before the step (c).

14. The method according to claim 12, wherein

the step (e) includes the steps of:

(e-1) introducing impurity of said predetermined conductivity at a first impurity concentration; and

(e-2) introducing impurity of said predetermined conductivity at a second impurity concentration higher than said first impurity concentration, and

the step (e-1) is performed after the step (d).

15. The method according to claim 11, wherein

the step (c) includes the step of supplying gas having an oxidation inhibiting function and reacting with said conductive layer including said gate electrode.

16. The method according to claim 11, wherein

by performing the step (b), said oxide film is made thinner in thickness in an out-of-gate-electrode region where said gate electrode is not formed,

the step (c) includes the step of forming a second oxidation inhibiting layer composed of an antioxidant between said oxide and said semiconductor substrate film in said out-of-gate-electrode region, and

by performing the step (d), said oxide film in said out-of-gate-electrode region is made thinner in thickness than said oxide film to be formed under the central portion of said gate electrode.

17. The method according to claim 16, wherein

the step (c) includes the step of supplying gas having an oxidation inhibiting function, reacting with said gate electrode and having higher reactivity with said

semiconductor substrate than said oxide film.